# An Analytical Model For Evaluating Interrupt-Driven System Performance Of Gigabit Ethernet Hosts With Finite Buffer

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## Summary

A novel analytical model based on Markov processes is developed to study the impact of interrupt overhead on operating system performance of network hosts such as PC-based routers, servers, and end hosts 'when subjected to Gigabit network traffic. Under heavy network traffic, the system performance will be negatively affected due to interrupt overhead caused by incoming traffic. In particular, excessive latency and significant degradation in system throughput can be experienced. Also, user applications may livelock as the CPU power is mostly consumed by interrupt handling and protocol processing. In this paper, we present an analytical model to evaluate system performance. The system performance is studied in terms of throughput, latency, stability condition, CPU utilizations of interrupt handling and protocol processing, and CPU availability for user applications. The analysis can be instrumental in choosing system design parameters offline, therefore allows capacity planning and system diagnosis. Analytical results are compared with the ideal limited buffer queueing system without interrupt overhead.